

California Regional Water Quality Control Board  
Santa Ana Region

January 17, 2003

ITEM: 11

SUBJECT: Cleanup and Abatement Order No. R8-2003-0013 for the County of  
San Bernardino, Solid Waste Management Division

DISCUSSION:

The County of San Bernardino owns about 487 acres of property in the North Rialto area of San Bernardino County (Figure 1). This property overlies the Rialto Groundwater Subbasin. The County initially purchased a portion of this property in 1957. Another portion was purchased in 1973. The northeastern area of the property (about 96 acres) was purchased in 1994. In 1958, the County of San Bernardino began operation of the Mid-Valley Sanitary Landfill (MVSL) at this site. Municipal wastes have been placed, or currently are being placed, on about 222 acres of this property. Ultimately, waste disposal activities will be expanded to include about 408 acres of the property. Early phases of the landfill (Units 1 and 2) were constructed on native soil without a clay or synthetic liner, or a leachate collection system. The most recent phase of the landfill (Unit 3) began operation in 2002. This phase has, and all future phases (Units 4 and 5) will have, a double composite liner and a leachate collection and removal system.

In 1987, the County began installing groundwater monitoring wells in response to a new state law that required groundwater monitoring at all municipal landfills. By 1998, the groundwater monitoring system for the MVSL included five upgradient wells and 24 downgradient wells. The County is currently extracting and treating groundwater that has been impacted by chlorinated volatile organic compounds (VOCs) from the MVSL, and has paid for a wellhead treatment system to remove VOCs from groundwater from a well owned by the Fontana Water Company.

In 1997 and 1998, the City of Rialto, City of Colton, West San Bernardino County Water District and the Fontana Water Company detected perchlorate in some of their municipal water supply wells in the Rialto, Colton and Chino Groundwater Subbasins. There are currently no state or federal drinking water standards for perchlorate. However, in 1997, the DHS established a drinking water Action Level (AL) for perchlorate of 18 parts per billion (ppb), and in 2002, DHS lowered the AL to four ppb. An AL is a temporary safe drinking water level that is based on limited studies that have been performed. Perchlorate is currently present in

the Rialto, Colton, Chino I and Chino II Groundwater Subbasins. The West San Bernardino County Water District, the Fontana Water Company, and the Cities of Rialto and Colton have limited or ceased use of 20 municipal water supply wells that exceed the AL for perchlorate. The perchlorate pollution of groundwater in the Rialto-Colton-Fontana area has created an extremely serious water quality and water supply problem. Regional Board staff is currently attempting to identify all parties that may have discharged perchlorate in these basins, and is exploring alternative ways to assist in solving the water supply problem.

In 1997, perchlorate was detected in low concentrations (less than 5 ppb) in groundwater samples collected from two of the MVSL monitoring wells (F-3 and F-6) located near the central east boundary of the County's property (Figure 2). These two monitoring wells are directly south, and partially downgradient of, the property that the County purchased in 1994. The property that the County purchased in 1994 contained 19 storage bunkers. The federal government constructed the bunkers during World War II for the storage of munitions. Following World War II, the property was subdivided and sold to the public. Subsequent to World War II, the bunkers appeared to have been used by various parties, in part, for the storage of explosives and fireworks. Perchlorate salts are commonly used as an oxidizer in various explosives, fireworks and in some munitions. A portion of the property the County purchased in 1994 was also apparently used for the manufacture of fireworks and the open burning or detonation of explosives by a hazardous waste facility. The County's operations contractor demolished the bunkers in 1998, and the debris from the bunkers was reportedly placed at the bottom of a berm on the County's property. A sand and gravel operation (Robertson's Ready Mix) utilizes a portion of the property that the County purchased in 1994, and another portion of the property is currently being used to stockpile several million cubic yards of soil for use by Robertson's. This soil is currently covering areas where some of the former bunkers were located

In 2001, the concentration of perchlorate in F-6, the easternmost of the two affected monitoring wells, suddenly increased to 250 ppb. Based on the types of activities that previously occurred on this property, it was evident that the property the County purchased in 1994 may be a source of the perchlorate found in the two monitoring wells. As a result, the County prepared and implemented a work plan to characterize perchlorate in soil and water at several locations on the County's property just north of the two monitoring wells, and to determine the vertical distribution of perchlorate in the two monitoring wells. Soil stockpiled for landfill cover and soil used for Robertson's aggregate processing operations were collected and analyzed for perchlorate. A by-product of the plant's operation is aggregate wash water that is conveyed from the plant to two desilting ponds. Fine-grained soils suspended in this wash water, and ultimately deposited on the bottom of the desilting ponds, were sampled. A total of five soil samples from the two ponds were collected and analyzed for perchlorate. Representative soil samples were also collected from the plant's desilting tank

and dewatering screen. A bulk soil sample was also collected from a small stockpile of native soil that was apparently generated during initial excavation of the desilting ponds. Water samples were also collected from the City water line that supplies water to Robertson's, the two desilting basins and the desilting tank. Thirteen groundwater samples were collected during the field investigation. Groundwater samples were collected from Robertson's inactive water supply well located at the facility and from different depths within each of the two monitoring wells.

The laboratory results for groundwater samples collected from F-3 and F-6 indicated that perchlorate concentrations increased with depth in the monitoring wells. Perchlorate was not detected in the sample collected from the inactive Robertson's water supply well. Perchlorate was also not detected in any soil or water samples collected from within the Robertson's facility or from the City water supply line. Therefore, this investigation did not identify the source of perchlorate found in the two monitoring wells.

In July 2002, the Executive Officer directed the County to investigate the lateral and vertical extent of perchlorate found in the two monitoring wells. Also, since perchlorate was used historically, and is still used, by several tenants of properties in the immediate vicinity of the landfill, it is possible that the landfill may have historically accepted perchlorate waste from these neighboring tenants. Therefore, the Executive Officer also directed the County to further investigate the area south of the MVSL to determine if the MVSL may be a current source of perchlorate. As a result, the County prepared and implemented a work plan to investigate groundwater in the area immediately north (upgradient) and east of monitoring wells F-3 and F-6, and the area south (downgradient) of the MVSL.

One replacement well (F-6A) for F-6 (it was necessary to replace F-6 because it was screened across multiple groundwater zones), and five new wells (N-1 through N-5), were installed to investigate the perchlorate found in F-3 and F-6. Two monitoring wells (S-1R and S-2) were installed approximately 1,300 and 2,600 feet south of the MVSL to determine if the MVSL may be a current source of perchlorate.

Based on the results of this groundwater investigation, and follow-up sampling, it is evident that perchlorate is being discharged to the groundwater from the northeastern area of the County's property. Perchlorate was not detected in groundwater samples obtained from the two wells (N-2 and N-4) that were installed north (upgradient) of the northeastern area of the County's property. Perchlorate was found in the four monitoring wells (F-6A, N-1, N-3 and N-5) that were installed south (downgradient) and east of the northeastern area of the County's property, with the highest concentration of 1,000 ppb found in N-3. Perchlorate was not detected in the two monitoring wells (S-1R and S-2) installed

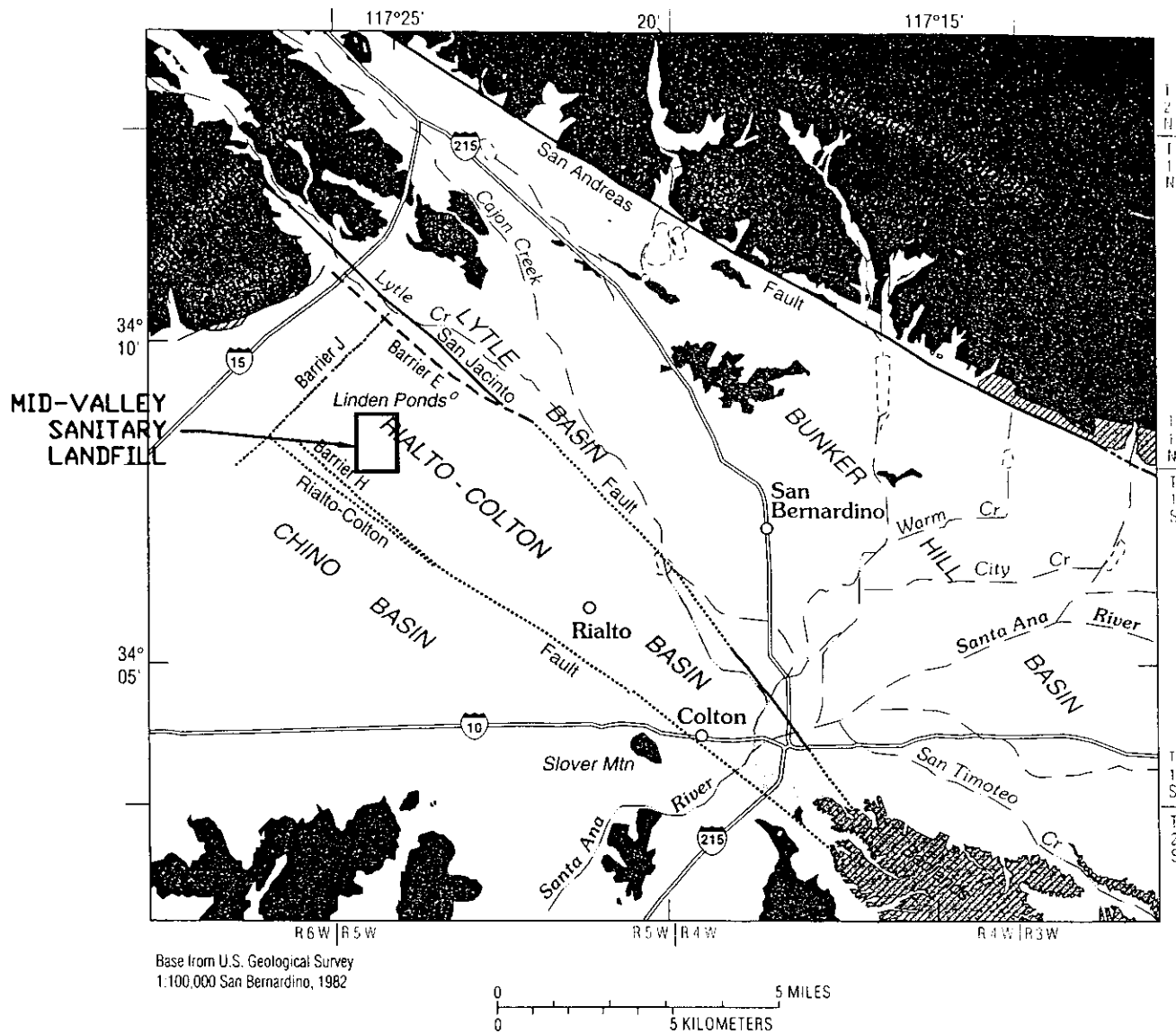
south (downgradient) of the MVSL. Therefore, information was not obtained that indicates the MVSL is a current source of perchlorate in groundwater.

The Executive Officer issued an Investigation Order to the County on September 26, 2002. This Order directed the County to further define the lateral and vertical extent of perchlorate in soil and groundwater in the vicinity of the MVSL. On November 15, 2002, the County submitted a work plan to investigate the lateral and vertical extent of perchlorate further east and southeast of the northeastern area of the County's property. Board staff has reviewed the work plan, and is coordinating and evaluating comments on the work plan that are being submitted by other interested parties.

Because perchlorate is being discharged from property owned by, and under the control of, the County, it is appropriate to order the County to cleanup and abate the effects of the discharge. The proposed order requires the County to further define the lateral and vertical extent of the perchlorate that is discharging, has been discharged, or threatens to be discharged, from the County's property, by implementing the work plan submitted on November 15, 2002, as approved by the Executive Officer, and by preparing and implementing any additional work plans that the Executive Officer deems necessary. The proposed order also requires the County to submit a detailed remedial action plan to cleanup or abate the effects of the perchlorate, after the Executive Officer determines that the lateral and vertical extent of perchlorate that is discharging, has been discharged, or threatens to be discharged from the County's property has been sufficiently defined. A similar order may be issued at a later date to former tenants or former owners of the County's property if Regional Board staff obtains additional information indicating that other specific tenants or owners are also responsible for the perchlorate that is present in the groundwater.

#### RECOMMENDATION:

Adopt Cleanup and Abatement Order No. R8-2002-0013 as presented.



#### EXPLANATION

- Unconsolidated deposits – Shaded in Rialto-Colton basin
- Partly consolidated deposits
- Consolidated rocks

FIGURE 1

#### RIALTO-COLTON GROUNDWATER BASIN

MID-VALLEY SANITARY LANDFILL  
COUNTY OF SAN BERNARDINO, CA



**GeoLogic Associates**

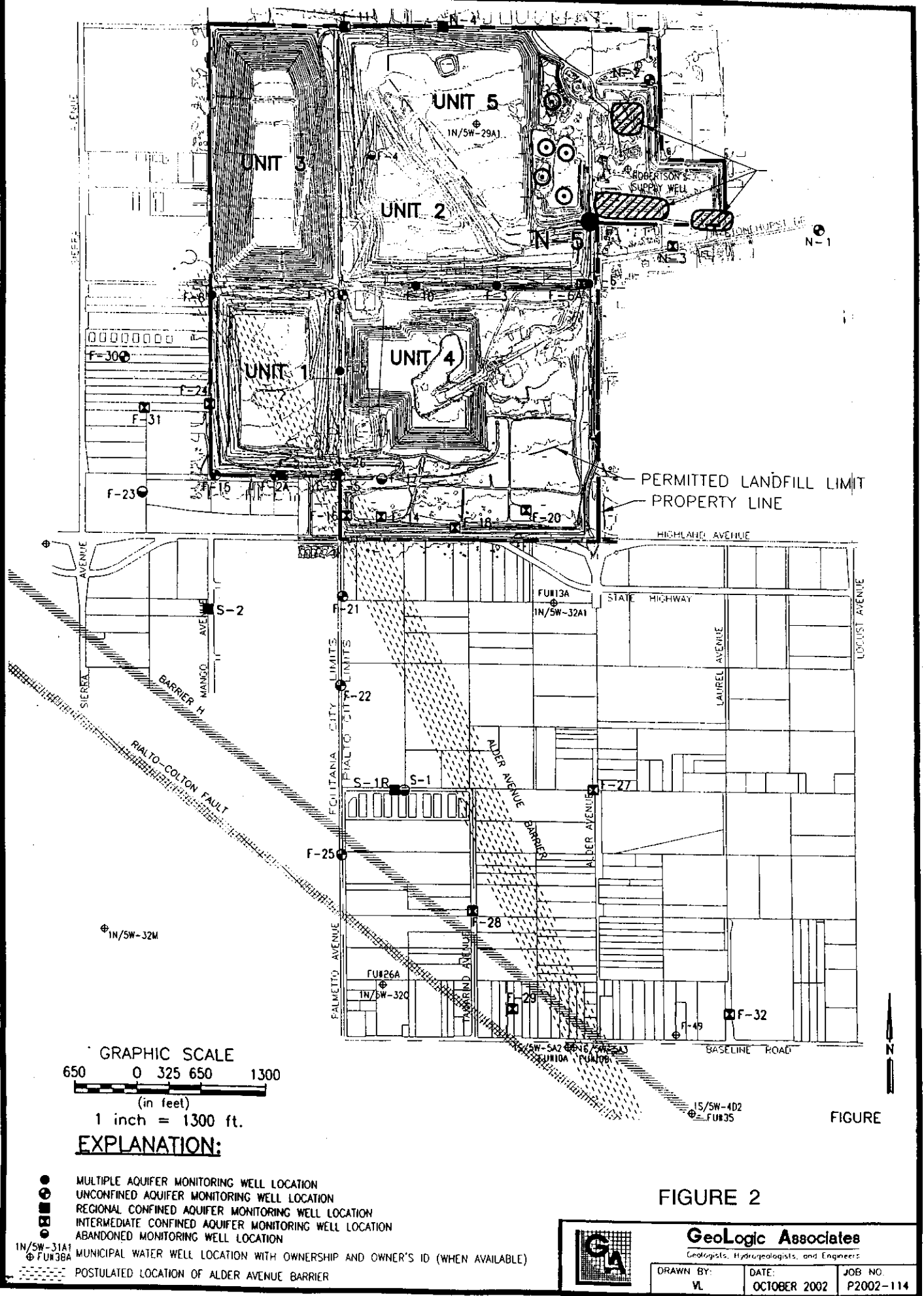
Geologists, Hydrogeologists, and Engineers

DRAWN BY:  
VL

DATE:  
JUNE 1998

JOB NO.  
9739

REFERENCE: U.S. GEOLOGICAL SURVEY  
WATER RESOURCES INVESTIGATION 97-4012



California Regional Water Quality Control Board  
Santa Ana Region

Cleanup and Abatement Order No. R8-2003-0013  
for  
County of San Bernardino, Solid Waste Management Division  
City of Rialto, San Bernardino County

The California Regional Water Quality Control Board, Santa Ana Region  
(hereinafter Regional Board), finds that:

1. The County of San Bernardino (hereinafter County) currently owns property in Sections 28 and 29, Township 1 North, Range 5 West, San Bernardino Base and Meridian, in the County of San Bernardino, State of California.
2. The County operates the Mid-Valley Sanitary Landfill (MVSL) on the property noted above. This property overlies the Rialto Groundwater Subbasin. The MVSL property consists of about 497 acres, of which about 222 acres are currently used for waste disposal activities. A sand and gravel operation utilizes a portion of the property in accordance with a formal agreement between the County and the sand and gravel operator. Soil is stockpiled on another portion of the property for processing by the sand and gravel operation prior to use of that portion of the property for landfilling. Ultimately, waste disposal activities will be expanded to include about 408 acres of the property, all within Section 29.
3. The MVSL is a municipal solid waste disposal facility that has been operated by the County since 1958. Landfilling of waste has been conducted in phases, with each phase consisting of waste being applied on a different portion of the property. Early phases of the landfill (Units 1 and 2) were constructed on native soil without a clay or synthetic liner, or a leachate collection system. The most recent phase of the landfill (Unit 3) began operation in 2002. This phase has, and all future phases (Units 4 and 5) will have, a double composite liner and a leachate collection and removal system.
4. Perchlorate, in the form of perchlorate salts, such as ammonium perchlorate, was used historically, and is still used, by several tenants of properties in close proximity to the landfill. Therefore, it is possible that the landfill may have accepted perchlorate waste from these neighboring tenants. However, there is currently no evidence that perchlorate waste was disposed in the landfill or that there has been a discharge of perchlorate from Units 1, 2 or 3 of the landfill.

5. The County purchased the northeast area of its current property in 1994. This property contained storage bunkers that were known to have housed explosives, chemicals, propellant, oxidizers, and fireworks. These bunkers were constructed, and were initially used, by the military in the mid-1940s. The bunkers were used subsequently by aerospace, hazardous waste and fireworks companies. Perchlorate salts were handled and stored in these bunkers. The County's operations contractor demolished the bunkers in 1998. A portion of this area is currently utilized by a sand and gravel operation.
6. Perchlorate salts are highly soluble and dissociate in water to form perchlorate ions. There are currently no state or federal drinking water standards for perchlorate. However, in 1997, the California Department of Health Services (DHS) established a drinking water Action Level (AL) for perchlorate of 18 parts per billion (ppb), and in 2002, DHS lowered the AL to four ppb. An AL is a temporary safe drinking water level that is based on limited studies that have been performed. Perchlorate is currently present in the Rialto, Colton, Chino I and Chino II Groundwater Subbasins. The West San Bernardino County Water District, the Fontana Water Company, and the Cities of Rialto and Colton have limited or ceased use of 20 municipal water supply wells that exceed the AL for perchlorate.
7. Municipal water supply wells in the Rialto, Colton, Chino I and Chino II Groundwater Subbasins have been, or are likely to be, affected by the perchlorate pollution in these basins. Regional Board staff is currently attempting to identify all parties that may have discharged perchlorate in these basins.
8. Perchlorate was initially detected in low concentrations (less than 5 ppb) in two of the MVSL monitoring wells in 1997. In 2001, the concentration of perchlorate in one of these wells increased significantly, to 250 ppb. As a result, the County increased its monitoring for perchlorate in existing monitoring wells and assessed possible perchlorate sources on its property, which included collecting and analyzing soil samples and process water samples from the sand and gravel operation on the northeast area of the County's property. The County found that the source of the perchlorate currently found in groundwater immediately adjacent to, and downgradient of, the County's property may be from the northeast area of its property that the County purchased in 1994.
9. Beginning in August 2002, the County installed six monitoring wells on, and in the vicinity of, the northeast area of their property. The analytical results of groundwater samples obtained from these monitoring wells showed that perchlorate was not present in the monitoring wells located



upgradient of the northeast area of the County's property, but was present in concentrations as high as 1,000 ppb in a monitoring well downgradient of the northeast area.

10. On September 26, 2002, the Executive Officer issued an Investigation Order to the County. This Order directed the County to further define the lateral and vertical extent of perchlorate in soil and groundwater in the vicinity of the MVSL.
11. On November 15, 2002, the County submitted a work plan to further define the lateral and vertical extent of perchlorate. Board staff has completed its review of the work plan, and is coordinating and evaluating comments on the work plan that are being submitted by other interested parties.
12. Based on the results of the soil and groundwater investigations conducted by the County, it is evident that perchlorate is being discharged to groundwater from property that is currently owned by the County.
13. The beneficial uses of the Rialto Groundwater Subbasin include:
  - A. Municipal and domestic supply,
  - B. Agricultural supply,
  - C. Industrial service supply, and
  - D. Industrial process supply.
14. The County has caused or permitted, or is causing or permitting, waste, i.e., perchlorate, to be discharged to waters of the state, specifically the Rialto Groundwater Subbasin, and has created, or threatens to create, a condition of pollution or nuisance.
15. California Water Code Section 13304 allows the Regional Board to recover reasonable expenses from responsible parties for overseeing cleanup and abatement activities. It is the Regional Board's intent to recover such costs for regulatory oversight work conducted in accordance with this order.
16. This enforcement action is being taken by a regulatory agency to enforce a water quality law. Such action is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et seq.) in accordance with Section 15321, Article 19, Division 3, Title 14, California Code of Regulations.

17. Additional investigation is necessary to define the vertical and lateral extent of the perchlorate that is discharging, has been discharged, or threatens to be discharged, from the County's property.
18. It is appropriate to order the County to clean up and abate the effects of the discharge of perchlorate from property that the County currently owns and controls.
19. A similar order may be issued at a later date to former tenants or former owners of the County's property if Regional Board staff obtains additional information indicating that other specific tenants or owners have also discharged perchlorate that is present in the groundwater.

IT IS HEREBY ORDERED THAT, pursuant to Section 13304, Article 1, Chapter 5, Division 7, of the California Water Code, the County of San Bernardino shall:

1. Implement the work plan submitted on November 15, 2002, as approved by the Executive Officer, in order to further define the lateral and vertical extent of the perchlorate that is discharging, has been discharged, or threatens to be discharged, from the County's property noted in Finding 1, above.
2. Prepare and implement additional work plans that the Executive Officer deems necessary to sufficiently characterize the lateral and vertical extent of perchlorate that is discharging, has been discharged, or threatens to be discharged, from the County's property. The work plans shall be implemented in accordance with time schedules approved by the Executive Officer.
3. After the Executive Officer determines that the lateral and vertical extent of perchlorate that is discharging, has been discharged, or threatens to be discharged from the County's property has been sufficiently defined, submit a detailed remedial action plan, including an implementation schedule, to cleanup or abate the effects of the perchlorate that is discharging, has been discharged, or threatens to be discharged, from the County's property. The remedial action plan and implementation schedule shall be submitted within 60 days of the Executive Officer's notification to the County that the definition of the extent of perchlorate is sufficiently complete. The remedial action plan and schedule shall be subject to approval by the Executive Officer.
4. Implement the remedial action plan in 3., above, as approved by the Executive Officer.

Order No. R8-2003-0013  
County of San Bernardino  
Solid Waste Management Division

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January 17, 2003

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an order adopted by the California Regional Water Quality Control Board, Santa Ana Region, on January 17, 2003.

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Gerard J. Thibeault  
Executive Officer